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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/676,259 | 10/02/2003 | Tsukasa Kuboshima | 2018-786 | 3478 |
| 23117 | 7590 | 01/05/2006 | EXAMINER | |
| NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203 | | | EDWARDS, LOREN CHARLES | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3748 | |
| DATE MAILED: 01/05/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/676,259

Applicant(s)

KUBOSHIMA ET AL.

Examiner

Loren C. Edwards

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-7, 10-12, and 14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/2/03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 10/02/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 5-6, 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakamoto (U.S. Pat. No. 6,079,203) in view of Hasegawa et al. (U.S. Pat. No. 5,548,514). Wakamoto discloses an exhaust gas cleaning system for an internal

combustion engine, the system comprising: an exhaust gas after-treatment device disposed in an exhaust passage of the engine (Fig. 4, No. 3 and 21; Col. 8, Lines 30-42); an outlet gas temperature sensing means for sensing outlet gas temperature of exhaust gas downstream of the exhaust gas after-treatment device (Fig. 4, No. 23; Col. 8, Lines 30-42); temperature estimating means for calculating estimated temperature of the exhaust gas after-treatment device from and output of the outlet gas temperature sensing means (Fig. 5, Steps 41-43; Col. 8, Lines 51-65); and a state detecting means for determining whether the exhaust gas after-treatment device is in a predetermined state, based on the estimated temperature calculated by the temperature estimating means (Fig. 4, No. 24; Fig. 5). Wakamoto fails to specifically discuss the use of an inverse transfer function to estimate the temperature of the exhaust gas after-treatment device. Hasegawa discloses an air/fuel ratio estimation system for an internal combustion engine that uses an inverse transfer function to estimate an engine operating parameter (Col. 5, Lines 40-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the engine parameter estimation means as taught by Hasegawa in the system of Wakamoto for the advantage of being able to change the computation parameters in response to frequent changes in the operating condition (Col. 1, Lines 34-40).

6. In regards to claim 5, the modified Hasegawa discloses the exhaust gas cleaning system of claim 1, as described above, and further comprising controlling means for controlling the exhaust gas after-treatment device within the predetermined state, based

on a result of the determination performed by the state detecting means (Fig. 5, Steps 41-49; Abstract).

7. In regards to claim 6, the modified Hasegawa, as described above discloses an exhaust gas cleaning system for an internal combustion engine, the system comprising: an exhaust gas after-treatment device disposed in an exhaust passage of the engine (Fig. 4, No. 3 and 21; Col. 8, Lines 30-42); an inlet gas temperature sensor for sensing inlet gas temperature of exhaust gas upstream of the exhaust gas after-treatment device (Fig. 4, No. 22; Col. 8, Lines 30-42); an outlet gas temperature sensor for sensing outlet gas temperature of the exhaust gas downstream of the exhaust gas after-treatment device (Fig. 4, No. 23; Col. 8, Lines 30-42); first temperature estimating means for calculating first estimated temperature of the exhaust gas after-treatment device from an output of the inlet gas temperature sensor with the use of a transfer function of a change in the temperature of the exhaust gas after-treatment device with respect to a change in the inlet gas temperature (Fig. 5, Steps 41-43; Col. 8, Lines 51-65; Wakamoto, Col. 5, Lines 40-50); second temperature estimating means for calculating second estimated temperature of the exhaust gas after-treatment device from an output of the outlet gas temperature sensor with the use of an inverse transfer function of a change in the outlet gas temperature with respect to the change in the temperature of the exhaust gas after-treatment device (Fig. 5, Steps 41-43; Col. 8, Lines 51-65; Wakamoto, Col. 5, Lines 40-50); and state detecting means for determining whether the exhaust gas after-treatment device is in a predetermine state, based on the first estimated temperature calculated by the first temperature estimating

means for the second estimated temperature calculated by the second temperature estimating means (Fig. 4, No. 24; Fig. 5).

8. In regards to claim 10, the modified Hasegawa discloses the exhaust gas cleaning system of claim 6, as described above, and further comprising: a catalyst supported on a surface of the exhaust gas after-treatment device (Fig. 4, No. 21; Col. 8, Lines 30-42), wherein the first estimated temperature of the exhaust gas after-treatment device is free from effect of reaction heat generated by the catalyst (Fig. 4, No. 22), and the second estimated temperature of the exhaust gas after-treatment device reflects the effect of the reaction heat generated by the catalyst (Fig. 4, No. 23).

9. In regards to claim 11, the modified Hasegawa discloses the exhaust gas cleaning system of claim 10, as described above, and further wherein the state detecting means includes degradation determining means for determining that the catalyst is degraded when a difference between the first estimated temperature and the second estimated temperature is smaller than a predetermined value (Fig. 5, Steps 1-49).

10. In regards to claim 12, the modified Hasegawa discloses the exhaust gas cleaning system of claim 11, as described above, and further wherein the state detecting means determines the predetermined value in accordance with an operating state of the engine

11. In regards to claim 14, the modified Hasegawa discloses the exhaust gas cleaning system of claim 1, as described above, and further wherein the exhaust gas after-treatment device is a member or a combination of two or more members selected

from the group consisting of a particulate filter with a catalyst, a particulate filter, an oxidation catalyst, a nitrogen oxide removal catalyst and a three-way catalyst (Fig. 4, No. 3 and 21; Col. 8, Lines 30-42).

12. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa as applied to claims 1 and 6 above, and further in view of Kawai et al. (U.S. Pat. No. 5,390,489). The modified Hasegawa discloses the exhaust gas cleaning system of claim 1, as described above, but fails to specifically discuss the temperature estimating means using the inverse transfer function expressed with first-order lag and dead time. Kawai discloses an air-fuel ratio control system for an internal combustion engine that uses a transfer function expressed with dead time and first-order lag to estimate an engine operating parameter (Fig. 2; Col. 2, Lines 8-18). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the dead time and first-order lag expressions for the transfer function of Kawai in the Hasegawa system for the advantage of faster response (Kawai; Col. 1 Line 59 – Col. 2, Line 9).

13. In regards to claim 7, the modified Hasegawa discloses the exhaust gas cleaning system of claim 6, as described above, and further wherein the first temperature estimating means uses the transfer function expressed with first-order lag and first dead time, and the second temperature estimating means uses the inverse transfer function expressed with first-order lag and second dead time (Fig. 2; Col. 2, Lines 8-18).

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa as applied to claim 11 above, and further in view of Wada (U.S. Pub. No.

2002/0099494 A1). The modified Hasegawa discloses the exhaust gas cleaning system as in claim 11, but fails to specifically discuss the state detecting means determining the predetermined value in accordance with an operating state of the engine. Wada discloses a catalyst deterioration detecting apparatus for an internal combustion engine that determines a predetermined value for use in catalyst deterioration detection based on engine operating conditions (Abstract). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize engine operating condition based value as taught by Wada in the system of Hasegawa for the advantage of basing deterioration detection on an optimal value conformed to the operation state of the engine (Page 1, Paragraph 5).

Allowable Subject Matter

15. Claims 3-4, 8-9, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren C. Edwards whose telephone number is (571) 272-2765. The examiner can normally be reached on M-TH 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Loren Edwards


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